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The Ergot Disease of Rye and Other Grains and Grasses

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Samples of ears of rye affected by Ergot have reached the botanical laboratory on infrequent occasions almost since the establishment of the Division of Botany. Only during the past few years have inquiries become more numerous, which might be taken as an indication that farmers have either become more trained in observing, or more suspicious of any unusual phenomenon noticed in their grain, or that Ergot has actually increased in frequency during recent years.

Attention has been called to this disease almost from the first and lately a number of press articles have been published throughout Canada. It would seem, however, that a brief statement relating to the nature and control of this trouble together with a good illustration might still better serve the purpose of guarding against the very undesirable possibility of an increase among the grain crops of the Dominion of this destructive disease.

Destructive, not only because of the actual decrease in yield or the contamination of the soil, or the fact that grain in which Ergot bodies are present is bound to be rejected at the elevators, but, last but not least, because of the dangerous effect on the gravid uterus in animals (abortion) and its general poisonous principles liable to seriously, often fatally, affect the health of man and animals. Years ago bread baked from flour made from Ergot-infected rye caused really serious trouble in some European countries. Fortunately progress in our knowledge of these things has prevented a recurrence of such issues in modern times; nevertheless the fact that hay seriously infected by Ergot—and apparently no single grass is immune—may unsuspectingly be fed to stock emphasizes how necessary it becomes to guard against all such losses. The Ergot bodies have a habit of accumulating at the bottom of the feeding trough and eventually the quantity may become large enough to cause serious harm when eaten. Even a smaller, but daily ration of Ergot grains among the feed is liable to expose animals to the disease known as Ergotism, a gangrenous malady usually affecting the lower extremities.

While we have not actually seen under ordinary farming conditions, anywhere in Canada, an accumulation of Ergot grains likely to cause these complications, nor an infection of pasture grasses serious enough to harm grazing animals, and while we believe that such quantities would have to be fairly considerable, this constitutes no reason why every precaution should not be exercised at all times to prevent exposure to these risks, to prevent the reduction in yield, contamination of the land, and the serious loss of having one's grain rejected at the elevators.

Ergot is caused by a fungus parasite the spores of which enter the floral parts of the plant when these are open at blossom time, and the result is the development of the Ergot bodies instead of the kernels of grain.

Our illustration shows, slightly more than natural size, an ear each of rye and wheat with the black, hornlike bodies (or so-called sclerotia) of Ergot protruding from a number of spikelets. In the rye specimen practically no normal seed was present; in the wheat a few grains only were found. On the left a sample of rye seed has been photographed, to which a number of Ergot grains have been added for comparison. These will readily be recognized by their colour, shape, and size. A number of the Ergot grains are usually broken in the threshing; even these broken pieces will germinate just as well as the unbroken. Since they are in size almost the same as rye, separation by the use of suitable sieves is practically impossible. These blackish bodies mature as the plants on which they grow mature. Many of these Ergot grains fall to

the ground, while others find their way into the threshed grain, and in this way the fungus is returned to the soil. In the spring, each of the Ergot bodies on, or near, the surface of the soil sends out several stalks which, in turn, bear many minute pockets containing innumerable spores. These are shot out of the spore-bearing cavity and carried upwards by air currents to the floral parts of susceptible plants. Under moist conditions, these spores send out tiny threads which grow into and fill the place where the new grain would have developed. At this stage there is exuded a large amount of sweet, sticky honeydew, and within it thousands of spores, which spread the fungus. Insects, attracted by this honeydew, carry the spores on their bodies to the floral parts of other plants. Rain also helps to spread these spores. Warm showers followed by sunny periods produce favourable conditions for the spread of the disease. After some days the honeydew stage comes to an end, and the familiar hard, black Ergot bodies form.

CONTROL

Controlling the disease becomes a matter of eliminating the Ergot from the seed and from the soil. Complete separation from the seed is possible by immersing the grain in a solution of common salt, made up by dissolving 40 pounds of salt in 25 gallons of water. On stirring the grain, the Ergot bodies come to the surface, where they are skimmed off and then destroyed. The grain is then washed with water at once, and dried quickly, to prevent injury to germination. A combined salt-formaldehyde treatment must not be attempted.

A succession of crops susceptible to Ergot should be avoided as far as possible. It is very important to avoid sowing either rye or durum wheat after Ergot-infested crops of these grains, since these two crops suffer most severely from the Ergot disease. The common wheats in use are rarely affected to any extent, and the same is true of barley and oats. Brome, slender wheat-grass, couch-grass, timothy, wild barley and other native grasses, which commonly grow on the borders of fields, roadsides and waste land, are also attacked by the Ergot fungus.

Drill seeding is much preferable to broadcasting for, in addition to burying the Ergot bodies deeply, the period of blossoming is shortened, thereby reducing the chances for infection. A mixed early and late rye should not be used, nor should the close planting of early and late varieties be practised. Deep ploughing after a badly infested crop is recommended, in order to bury the Ergot bodies which have fallen to the ground during harvest. If these are deeply buried, they will not be able to germinate successfully and produce spores. Care should be taken that the ploughing be sufficiently deep to prevent the Ergot bodies being brought to the surface by subsequent cultivation. Early harvest lessens the number of Ergot bodies which fall to the ground. It is also a very profitable practice to mow or destroy other grasses which are susceptible and growing nearby; the mowing to be done while they are still in blossom. These wild grasses are very often the principal source of infection.

No suitable variety of rye, or of wheat, has yet been found to be resistant to the Ergot disease.

Since a most useful drug is manufactured from fresh Ergot grains, especially of rye, it is suggested that any considerable amount of Ergot grains removed by above process be thoroughly rinsed in water and quickly dried. These may be offered for sale to manufacturing chemists or drug concerns, and the returns received for them will help to defray the cost of treatment, and somewhat recompense for the loss sustained.

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